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| 09/549,279      | 04/14/2000  | Masaki Ichihara      | P/2291-85           | 9019             |

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09/07/2004

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| EXAMINER |
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CHANG, EDITH M

|          |              |
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| ART UNIT | PAPER NUMBER |
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2637

DATE MAILED: 09/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/549,279

Applicant(s)

ICHIHARA, MASAKI

Examiner

Edith M Chang

Art Unit

2637

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 23 June 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,2,4-6 and 12-14 is/are rejected.
- 7) ☒ Claim(s) 3 and 7-11 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Response to Arguments/Remarks*

1. Applicant's arguments filed June 23 2004 have been fully considered but they are not persuasive.

**A:** The applicant argues that regarding claims 1, 5, 13, and 14, the references, whether taken individually or in combination, do not disclose or suggest the invention claimed.

**Response:** The references Secord et al. and Natali et al. are in the same field of endeavor as the application, the multi-carrier CDMA communication system. The combined/modified system discloses/suggests the invention claimed, provides the details of the limitations to implement/complete the functions, to receive and downconvert the received CDMA signal on the I-Q plane to A/D for the purpose of digital processing the received multi-carrier CDMA signal (refer the rationale of the rejections).

**B:** The applicant argues that a control data generator for generating control data from a frequency difference between a frequency band and the predetermined frequency band does not present in the cited reference regarding independent claims 1, 5, 12, 13, and 14.

**Response:** In Fig.3, Secord et al. discloses the control data from a frequency difference ( $\Delta\omega$ ) between the frequency band and the predetermined frequency band ( $\omega_c$ ) as the spectrum shown in the FIG.10 of the current application. Secord et al. provides the control data generator generating the control data (Fig.4  $\omega_c$  and  $\Delta\omega$  provided by the generator). When the In-phase (I) components and Quadrature (Q) component produced,

Art Unit: 2637

a quadrature frequency converter/generator is assumed to produce I and Q components in the current invention without presenting the generator. The same is held for control data generator of the reference, when the control data shown, there is a control data generator produces the control data. Therefore, the cited references do present the control data generator as cited in the claims.

**C:** The applicant disagrees with the assertion that regarding to independent claims 1, 5, 12, 13 and 14, that Second provides a control data generator generating the control data from a frequency difference. The control data generator recited in Applicant's claims includes a phase data generator *for generating phase data from the frequency difference in synchronization with the predetermined sampling clock, and a converter for converting the phase data to the control data consisting of a plurality of control bits.*

**Response:** The independent claims 1, 5, 12, 13 and 14 do not recite the limitations as stated. The limitations (e.g. the phase data and the plurality of control bits stated in the arguments) in the specification do not read in the claim when these limitations are *not recited in the claim* (see MPEP 2111).

**D:** The applicant argues that Natali does not to cure the above-recited deficiency but to disclose an I-Q plane.

**Response:** In FIG.3, Hellberg et al. teaches the phase data generator and converter of plurality bits. Hellberg et al. cures the deficiency. Refer to the rationale of the rejection of the office action.

The rejections are upheld.

***Specification***

2. The abstract of the disclosure is objected to the informality. In lines 1-3, "A frequency shifting circuit suitable for a digital demodulator in a multi-carrier communications system is disclosed" is suggested replacing by "This invention is regarding a frequency shifting circuit suitable for a digital demodulator in a multi-carrier communications system". Correction is required. See MPEP § 608.01(b).

***Claim Objections***

3. Claims 5-11 and 12 is objected to because of the following informalities:

Claim 5, line 15: "the signal vector" is suggested changing to "the signal vector rotator".

Claim 12, line 11, "the plurality" is suggested changing to "a plurality" and "the predetermined" is suggested changing to "a predetermined".

Claims 6-11 directly or indirectly dependent on the objected claim 5.

Appropriate corrections are required.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1, 5, 12-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Secord et al. (US 6097712) in view of Natali et al. (US 6317412 B1).

Regarding **claims 1 & 13**, except explicitly specify the I-Q plane, Secord et al. discloses a digital circuit and its method for shifting a frequency band of a signal vector to a predetermined frequency band (Fig.3, Fig.4-6), comprising: control data generated from a frequency difference (42-46 Fig.4 where the inputs  $\omega_c$ ,  $\Delta\omega$  of 42-46 provide the control data), note that there is inherently a control data generator generating the control data; and a signal vector rotator for rotating the signal vector (42 Fig.4 is the rotator). However Natali et al. teaches I-Q plane (24 FIGURE 8), as the Secord et al.'s receiver and its methods for CDMA spread-spectrum communications, through Natali et al.'s teaching to prepare the receiver for the spread spectrum communication, at the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the Natali et al.'s teaching implemented in Secord et al.'s rake receiver, to receive and downconvert the received CDMA signal on the I-Q plane to A/D for the purpose of digital processing the received multi-carrier CDMA signal.

Regarding **claims 5 & 14**, except explicitly specify the I-Q plane, and the analog-to-digital converter that obviously included elements of the Secord et al.'s CDMA multi-carrier receiver/rake receivers, Secord et al. discloses a digital circuit and its method for shifting a frequency band of a signal vector to a predetermined frequency band (Fig.3, Fig.4-6), comprising: control data generated from a frequency difference (42-46 Fig.4 where the inputs  $\omega_c$ ,  $\Delta\omega$  of 42-46 provide the control data), note that there is inherently a control data generator generating the control data; and a signal vector rotator for rotating the signal vector (42 Fig.4 is the rotator), a band pass filter (48 Fig.4). However Natali et al. teaches I-Q plane (24 FIGURE 8) and the analog-to-digital converter for converting a received analog signal vector to the signal vector (25 FIGURE 8), as the Secord et al.'s

Art Unit: 2637

receiver and its methods for CDMA spread-spectrum communications, at the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the Natali et al.'s teaching implemented in Secord et al.'s rake receiver, to receive and downconvert the received CDMA signal on the I-Q plane to A/D for digital processing the received multi-carrier CDMA signal.

Regarding **claim 12**, except explicitly specify the I-Q plane, and the analog-to-digital converter that obvious included elements of the Secord et al.'s CDMA multi-carrier receiver/rake receivers, Secord et al. discloses a digital circuit and its method for shifting a frequency band of a signal vector to a predetermined frequency band (Fig.3, Fig.4-6), comprising: control data generated from a frequency difference (42-46 Fig.4 where the inputs  $\omega_c$ ,  $\Delta\omega$  of 42-46 provide the control data), note that there is inherently a control data generator generating the control data; and a signal vector rotator for rotating the signal vector (42 Fig.4 is the rotator), a band pass filter (48 Fig.4). However Natali et al. teaches I-Q plane (24 FIGURE 8, where the quadrature frequency converter downconverts a quadrature signal) and the analog-to-digital converter for converting a received analog signal vector to the signal vector (25 FIGURE 8), as the Secord et al.'s receiver and its methods for CDMA spread-spectrum communications, at the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the Natali et al.'s teaching implemented in Secord et al.'s rake receiver, to receive and downconvert the received CDMA signal on the I-Q plane to A/D.

Art Unit: 2637

6. Claims 2, 4, & 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Secord et al. (US 6097712) in view of Natali et al. (US 6317412 B1) as applied to claims 1 and 5 above, and further in view of Hellberg (US 6167102).

Regarding **claim 2**, Natali et al. discloses an analog-to-digital converter for converting a received analog signal vector to the signal vector (25 FIGURE 8), but does not explicitly specify a phase data generator and converter. However Hellberg teaches the phase data generator and converter of plurality bits (340 FIG.3). As Natali et al. teaches using NCO to provide the frequency (41 FIGURE 8 '412) in the control data generator, at the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the Hellberg's teaching in the NCO to detail its operation to provide the phase to have a more efficient NCO with simpler computation (column 3 lines 48-55).

Regarding **claims 4 & 6**, further Hellberg et al. teaches the phase data generated by computing an integral multiple of a unit angle which is obtained from a frequency shift (FIG.2, column 2 lines 25-30 where the frequency/sinusoidal value is the one of eight distinct 210 with a unit angle multiplied by 1 to 8). At the time of the invention, it would have been obvious to a person of ordinary skill in the art to have the Hellberg's teaching in the NCO to detail its operation to provide the phase to have a more efficient NCO with simpler computation (column 3 lines 48-55).

#### ***Allowable Subject Matter***

7. Claims 3, 7-11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.



***Conclusion***

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

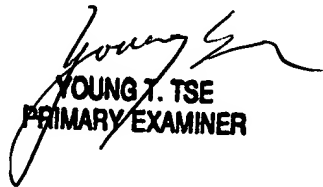
9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edith M Chang whose telephone number is 571-272-3041. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jayanti Patel can be reached on 571-272-2988. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2637

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Edith Chang  
August 30, 2004

  
YOUNG T. TSE  
PRIMARY EXAMINER